Evanoff B, Yung M, Buckner-Petty S, Baca M, Andersen JH, Roquelaure Y, Descatha A, Dale AM

Cross-national comparison of two general population job exposure matrices for physical work exposures

ABSTRACT

OBJECTIVES - Job exposure matrices (JEMs) are increasingly used to estimate physical workplace exposures. We conducted a cross-national comparison of exposure estimates from two general population JEMs to aid the interpretation of exposure-outcome associations across countries and to explore the feasibility of cross-national application of JEMs to provide workplace physical exposure estimates. METHODS - We compared physical exposure estimates from two general population JEMs created from the FrenchCohorte des consultants des Centres d'examens de santé study (27 exposure variables) and the American Occupational Information Network database (21 exposure variables). These exposure variables were related to physical demands or ergonomic risk factors for musculoskeletal disorders. We used a crosswalk to match French Profession et Catégorie Sociale job codes with American Standard Occupational Classification job codes and calculated Spearman's correlations and Cohen's kappa values for exposure variable pairs between these French and American JEMs. We defined a priori 50 matched French and American JEM variable pairs that measured similar exposures. RESULTS - All variable pairs measuring similar physical exposures demonstrated positive correlations. Among the 50 matched pairs, 33 showed high correlation ($\rho \geq 0.70$) and 46 showed at least moderate agreement ($\kappa \geq 0.41$). Exposures expected to be mutually exclusive (manual work vs office work) showed strongly negative correlations. CONCLUSIONS - French and American general population physical exposure JEMs were related, sharing moderate to high association and moderate to substantial agreement between the majority of variable pairs measuring similar exposures. These findings will inform cross-national comparisons of study results and support some uses of general population JEMs outside their countries of origin.

KEYWORDS: Biomechanical exposure assessment; Epidemiology; Ergonomics; Musculoskeletal disorders

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